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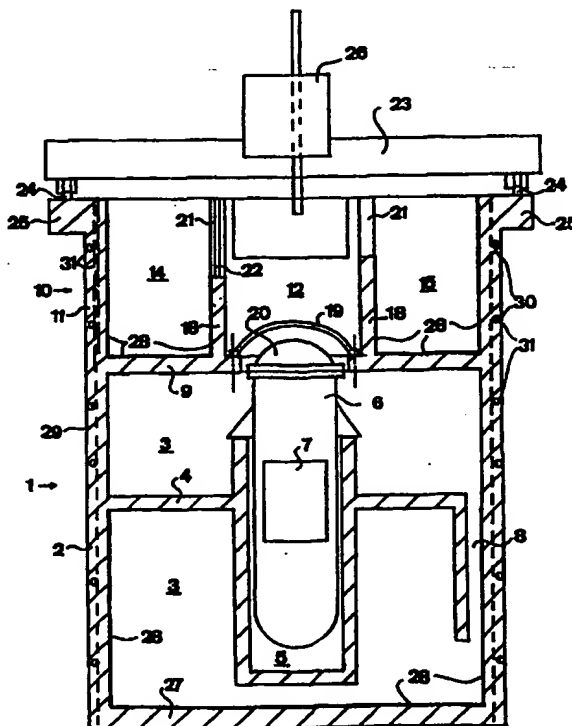
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(54) Title: A NUCLEAR REACTOR DEVICE AND A METHOD TO CONSTRUCT A NUCLEAR REACTOR DEVICE

(57) Abstract

The invention refers to a nuclear reactor device and a method of constructing a nuclear reactor device. The device comprises a reactor containment (1), formed by a first wall member (2) defining an inner space (3), and a reactor vessel (6), housing a reactor core (7) and being provided in the inner space (3). Furthermore, the device comprises an upper space (10) provided above the reactor containment (1) and defined by a second wall member (11). The first wall member (2) and the second wall member (11) have, seen in a horizontal section, an essentially identical cross-sectional shape and form an essentially common cylinder.



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Title:

A nuclear reactor device and a method to construct a nuclear reactor device

THE BACKGROUND OF THE INVENTION AND PRIOR ART

The present invention refers to a nuclear reactor device comprising a reactor containment, formed by a first wall member and enclosing an inner space, a reactor vessel housing a reactor core and being provided in the inner space, and an upper space provided above the reactor containment and defined by a second wall member. Such a nuclear reactor device is disclosed in US-A-5 201 161. The invention also refers to a method of constructing a nuclear reactor device, comprising the steps of casting a first wall member defining an inner space of a reactor containment intended to comprise a reactor vessel to be provided in the inner space and house a reactor core, and providing a second wall member defining an upper space above the reactor containment.

The fuel in the reactor core in such nuclear reactor devices needs to be regularly replaced by new fuel or to be displaced in the core. In order to perform this work, the reactor vessel is open and internal parts are removed therefrom, whereafter the fuel may be lifted out of the reactor vessel. The fuel as well as the internal parts are highly radioactive so that all handling has to be performed under water functioning as a radiation shield and also as cooling medium. In order to enable short fuel replacement period, the fuel and the internal parts are temporarily stored in water-filled pools provided in an upper space located above the reactor containment in the so called reactor building. Traditionally, these pools have been

designed with a rectangular or square cross-section. The handling of the fuel, the internal parts and other equipment is performed by means of a fuel handling apparatus and overhead cranes which may be manoeuvred in a rectangular co-ordinate system and move the fuel, the internal parts and the other equipment between different pools and between the pools and the reactor vessel.

It is known to design the reactor containment with a circular cylindrical cross-section seen in a horizontal section. Such a shape is advantageous from a strength point of view and permits to subject the reactor containment to an overpressure in case of pipe breakage accidents or severe accidents and also for sub-pressures, which may arise in certain accident situations.

The combination of the rectangular or square upper space for said pools and the circular cylindrical reactor containment located thereunder, is a technical and time-consuming difficulty during design and construction of nuclear power devices of the type defined above. The transition from a circular cylindrical section to a square section involves an interruption of the construction work and new equipment must be supplied before the construction of the walls of the upper space. From a design point of view, it is furthermore difficult to manage the strength requirements without increasing, to greater expenses, the dimensions of the wall members defining the upper space and the pools enclosed therein.

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JP-A-5 107 381 discloses a reactor containment consisting of six modules, defining a lower space having a reactor, and of three modules, which seem to define an upper space. The lower space has a square cross-section shape whereas the upper space has a rectangular cross-section shape.

SUMMARY OF THE INVENTION

The object of the present invention is to simplify the construction of a nuclear reactor device of the type defined
5 above and thereby reduce the construction time thereof.

This object is obtained by the nuclear reactor device initially defined and characterized in that the first wall member and second wall member have, seen in a horizontal
10 section, an essentially identical cross-section shape and form an essentially common cylinder. By such a design of the wall members for the reactor containment and the upper space located thereabove, these wall members may be manufactured at one go immediately after each other. It means that the
15 same equipment and the same form may be utilized for both wall members. Consequently, it is possible to reduce the construction time necessary and in such a manner reduce the construction expenses. In accordance with the invention, said essentially common cylinder may have an arbitrary
20 cross-sectional shape; for instance it may be circular, elliptic, oval, square, rectangular.

According to an embodiment of the invention, said cross-sectional shape is essentially circular cylindrical. Such a
25 shape has a high strength and may therefore carry large loads and stand large pressure changes. It means that the design and the construction of the wall member surrounding the upper space may be simplified in comparison with previously known technique according to which the upper
30 space was surrounded by a rectangular wall member.

According to a further embodiment of the invention, the first wall member and the second wall member are cast in a continuous piece by means of sliding form casting. Such a
35 sliding form casting is known per se and enables a very short time of construction. Since the both wall members have

essentially the same cross-sectional shape, one and the same sliding form may be utilized for the complete casting operation. Advantageously, the first wall member and the second wall member are cast in concrete with reinforcement members provided in the concrete, which comprise tightening members arranged to enable a prestressing of said wall member. Said tightening members may extend in the second wall member, at least in one of the directions about the upper space and along the upper space.

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According to a further embodiment of the invention, at least the second wall member comprises a wall coating provided onto the inner side thereof. Such a wall coating, which advantageously may be made of stainless steel, may function as a protection for the concrete against water present in the upper space. The wall coating may advantageously together with the reinforcement members be mounted together in advance to module blocks which are lifted to a position when the sliding form casting has reached a suitable level and thus before the casting proper of the upper wall member is performed. Thereby, the wall coating may function as a limiting wall of the form, i.e. it is sufficient that the outer form wall is sliding.

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According to a further embodiment of the invention, the upper space is divided in part spaces by means of at least one primary wall element extending between two separated attachment portions of the second wall member. Such part spaces may form water-filled pools for fuel, internal parts from the reactor vessel and other equipment. Advantageously, there are two primary wall elements which are separated from each other and which each extends between two separated attachment portions of the second wall member, and furthermore two secondary wall elements, which extend between the two primary wall elements and which between themselves and together with the primary wall elements form

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an isolated part space, which may be located above a cover device of a separating wall separating the upper space from the inner space. Moreover, such primary wall elements function as load-absorbing elements in case of an overpressure in the reactor containment.

According to a further embodiment of the invention, door members are arranged to provide a passage between at least two of said part spaces. This embodiment enables a simple transport of fuel and internal parts from the reactor vessel through the isolated space and into further part spaces located outside the isolated space. By such short transport ways, the time consumption during fuel replacement and revision may be maintained at a low level.

The object stated above is also obtained by the method initially defined and characterized in that the first wall member and the second wall member are cast by means of an essentially common form being lifted upwardly during the course of the casting process. By such a casting technique, it is thus possible to cast both the wall members at one go in a significantly shorter period of time than according to the art previously known. Advantageously, said form comprises a sliding form.

According to an embodiment of the inventive method, the casting of the second wall member is preceded by the lifting to a position of prepared blocks comprising reinforcement members and an inner wall coating. Such blocks may advantageously be manufactured at the same time as the casting of the first wall member is performed and in such a manner the total time consumption may be kept on a low level.

According to a further embodiment of the inventive method, tightening members are provided during the course of the

casting process in said wall member in such a manner that they extend in at least one of the directions about said spaces and along said spaces, and after the casting process the tightening members are tightened in order to prestress said wall member. Thereby, the tightening members may be provided in tubes provided in said wall member. After or in connection with said tightening, concrete may be injected into said tubes.

10 BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is now to be explained more closely by means of different embodiments, which are disclosed merely by way of example, and with reference to the drawings attached.

Fig 1 discloses a view from above of a nuclear reactor device according to an embodiment of the invention.

Fig 2 discloses a section through the nuclear reactor device along a line II-II in Fig 1.

20 DETAILED DESCRIPTION OF DIFFERENT EMBODIMENTS

Figs 1 and 2 disclose schematically a nuclear reactor device according to the present invention. The device comprises a reactor containment 1 formed by a first essentially circular cylindrical wall member 2 enclosing and defining an inner space 3. The inner space 3 comprises an upper primary space and a lower secondary space, which are separated from each other by means of an essentially horizontal intermediate wall 4, which in its central part forms a cavity 5 extending downwardly from the primary space and housing a reactor vessel 6 in which a reactor core 7 is provided. Through the primary space of the inner space 3, a steam conduit, not disclosed, extends out of the reactor containment to a steam turbine plant. From the turbine plant, a feed water conduit, not disclosed, extends back through the reactor containment

1 and the primary space to the reactor vessel 6. The primary space of the inner space 3 is connected to the secondary space via a number of vertical channels 8. The secondary space of the inner space 3 comprises a so-called
5 condensation pool comprising water for cooling and for the condensation of steam from the primary space.

The reactor containment 1 is delimited upwardly by an essentially horizontal separating wall 9 forming a bottom in
10 an upper space 10 provided above the reactor containment 1. The upper space 10 is delimited and defined by a second essentially circular cylindrical wall member 11 forming a continuing part of the first wall member 2. This means that the first wall member and the second wall member have an
15 essentially identical cross-sectional shape seen in a horizontal section and are essentially concentric to each other.

As appears from Fig 1, the upper space 10 is divided into
20 five part spaces 12, 13, 14, 15, 16. This division is made by means of two primary wall elements 17 being essentially parallel to each other and extending between two respective separated attachment portions of the inner surface of the second wall member 11. Between these two wall elements 17,
25 two secondary wall elements 18 being essentially parallel to each other extend. Between the two secondary wall elements 18 and the two primary wall elements 17, the part space 12, forming a central part space isolated from the other part space 13-16, is enclosed. The central part space 12 is
30 located above a dome-shaped cover member 19 which may be removed and thereby uncover the reactor vessel 6 which in turn comprises, at its upper end, a dome-shaped cover member 20 which may be removed in order to uncover the interior of the reactor vessel 6. The central part space 12 is connected
35 to each of the other part spaces 13-16 via a respective passage 21, which may comprise an openable door member 22.

Furthermore, the nuclear reactor device comprises a traverse device 23 which is movable on two rails 24 carried by a schematically indicated base 25 attached to the wall element

5 11. The traverse device 23 comprises a schematically disclosed fuel replacement apparatus and a lifting device 26, which is movable along the traverse device 23. The cover members 19 and 20 are lifted by means of a larger, not disclosed reactor building traverse device and are

10 positioned in the reactor building outside the upper space 10. Thereafter, internal parts, such as for instance steam separators, may be lifted out of the reactor vessel 6 and positioned in for instance the part space 13. By means of the fuel replacement apparatus and the lifting device 26,

15 the fuel rods may thereafter be lifted out of the reactor 6 and positioned in for instance the part space 14. Thereby, the door member 22, separating the part space 14 from the central part space 12, has been removed by means of the fuel replacement apparatus and the lifting device 26. It is to be

20 noted that the part spaces 12-16 form water-filled pools, enabling the performance of said handling of the fuel and internal parts in such a manner that these always are located under water. The passage 21 in the fuel pool, in the example disclosed the part space 14, has such a depth that

25 the fuel always is located in a radiation-protecting manner under the water surface during the passage to and from the part space 14. Furthermore, the part space 14 has such a depth that an upper edge of the fuel which has been placed in the part space 14 always is located below the lower edge

30 of the passage 21. As a part of the pools 13, 15 and 16, a separate emergency cooling pool may be housed, which is utilized during cooling of the core in the reactor vessel and/or during cooling of the condensation pool.

35 The first wall member 2, the second wall member 11, the intermediate wall 4 and the separating wall 9 as well as a

bottom wall 27 of the reactor containment 1 are all manufactured in concrete. The inner surfaces, forming pools and thus being subjected to water, are provided with a wall coating 21 which is indicated in Fig 2 by means of somewhat thicker lines and which may be manufactured in any corrosion-resistant material as for instance stainless steel.

The first wall member 2 and the second wall member 11 may in accordance with the present invention be manufactured by so called sliding form casting. It means that a form having an inner limiting wall and an outer limiting wall slowly is moved upwardly from the bottom wall 27 of the reactor containment 1 during a continuous supply of concrete. The lifting speed is so slow that the concrete provided inside the form has time to solidify during the time period of the movement of the sliding form from the position where the concrete was supplied. In such a manner, the first wall member 2 and the second wall member 11 may both be cast at one go in one single continuous casting process. In the wall members 2, 11, relatively large quantities of reinforcement bars, which are not disclosed in Figs 1 and 2, are contained. The vertical wall coating 28 of the second wall member 11 and the reinforcement intended for the second wall member 11 may advantageously be produced in advance in blocks, which are lifted to a position prior to the performance of the casting proper. Furthermore, tightening members 29 and 30 are provided in the wall members 2, 11 in such a manner that they extend essentially vertically along and about the upper space 10 and the inner space 3. The tightening members 29 and 30 are provided in tubes 31, which are cast within the concrete. For each round, two tubes 31 are provided, which extend over a respective semiround or a pipe extending around the complete round. Likewise, for each round tightening members 30 are provided, one in each tube 31. The tightening members 30 are tightened by means of

schematically disclosed tightening devices 32 provided diametrically opposite to each other. The tightening takes place after the solidification of the concrete and involves a prestressing of the wall elements 2, 11 in such a manner that they may resist larger forces. Tightening devices (not disclosed) similar to the tightening devices 32 are provided for the vertical tightening members 29. It is also possible to let the tubes 31 form parts of said blocks.

10 In order to further simplify the casting process, one may let the wall coatings 28 form the inner limiting wall of the casting form, which means that merely one sliding outer limiting wall needs to be provided, at least for the part of the wall members 2, 11 which are provided with wall coatings 15 28.

The disclosed embodiment of the primary wall elements 17, as horizontal beams, leads to an improved strength of the second wall member 11. They will also contribute to the support of the forces from the separating wall 9 at an overpressure in the reactor containment 1 and in such a manner increase the strength of the reactor containment 1.

The invention is not limited to the embodiments disclosed herein but may be varied and modified within the scope of the following claims. For instance, it is to be noted that the wall elements 17 and 18 may have another extension than the one disclosed. It is for instance possible to provide a circular cylindrical wall element surrounding the dome-shaped cover member 19 and to provide radially extending wall elements between the wall member 11 and such an inner circular cylindrical wall element. The rails of the traverse device may be provided in another manner, for instance they may lie on the upper edge side of the primary wall elements 17 or be provided as a rail located on the upper edge side of the other wall element 11, the movement of the fuel

replacement apparatus and the lifting device 26 being performed by means of polar co-ordinates.

Claims

1. A nuclear reactor device comprising:
 - a reactor containment (1), formed by a first wall member (2) defining an inner space (3),
 - a reactor vessel (6), housing a reactor core (7) and being provided in the inner space (3), and
 - an upper space (10) provided above the reactor containment (1) and defined by a second wall member (11),

10 characterized in that the first wall member (2) and the second wall member (11) have, seen in a horizontal section, an essentially identical cross-sectional shape and form an essentially common cylinder.
- 15 2. A nuclear reactor device according to claim 1, characterized in that said cross-sectional shape is essentially circular.
- 20 3. A nuclear reactor device according to claim 2, characterized in that the first wall member (2) and the second wall member (11) are cast in a continuous piece by means of sliding form casting.
- 25 4. A nuclear reactor device according to claim 3, characterized in that the first wall member (2) and the second wall (11) are cast in concrete with reinforcement members (29, 30) provided in the concrete and comprising tightening members (30) arranged to enable a biasing of said wall members (2, 11).
- 30 5. A nuclear reactor device according to claim 4, characterized in that said tightening members (29) extend in the second wall member (11) at least in one of the directions about the upper space (10) and along the upper space (10).
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6. A nuclear reactor device according to any one of the preceding claims, characterized in that at least the second wall member (11) comprises a wall coating (28) provided onto the inner side.

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7. A nuclear reactor device according to any one of the preceding claims, characterized in that the upper space (10) is divided into part spaces (12 - 16) by means of at least one primary wall element (17) extending between two separated attachment portions of the second wall member (11).

8. A nuclear reactor device according to claim 7, characterized by two primary wall elements (17) separated from each other and each extending between two separated attachment portions of the second wall member (11).

9. A nuclear reactor device according to claim 8, characterized in that the two primary wall elements (17) are essentially parallel to each other.

10. A nuclear reactor device according to any one of claims 8 and 9, characterized by two secondary wall elements (18) which extend between the two primary wall elements (17) and which between themselves and together with the primary wall elements (17) form an isolated part space (12).

11. A nuclear reactor device according to claim 10, characterized in that the isolated part space (12) is located above a cover device (19) of a separating wall (9) separating the upper space (10) from the inner space (3).

12. A nuclear reactor device according to any one of the preceding claims, characterized by door members (22) arranged to provide a passage (21) between at least two of said part spaces (12 - 16).

13. A method of constructing a nuclear reactor device, comprising the steps of:

- casting a first wall member defining an inner space of a reactor containment intended to comprise a reactor vessel to be arranged in the inner space and housing a reactor core, and
- providing a second wall member defining an upper space above the reactor containment, characterized in that the first wall member and the second wall member are cast by means of an essentially common form being lifted upwardly during the course of the casting process.

14. A method according to claim 13, characterized in that the said form comprises a sliding form.

15. A method according to any one of claims 13 and 14, characterized in that the casting of the second wall member is preceded by the lifting to a position of prepared blocks comprising reinforcement members and an inner wall coating.

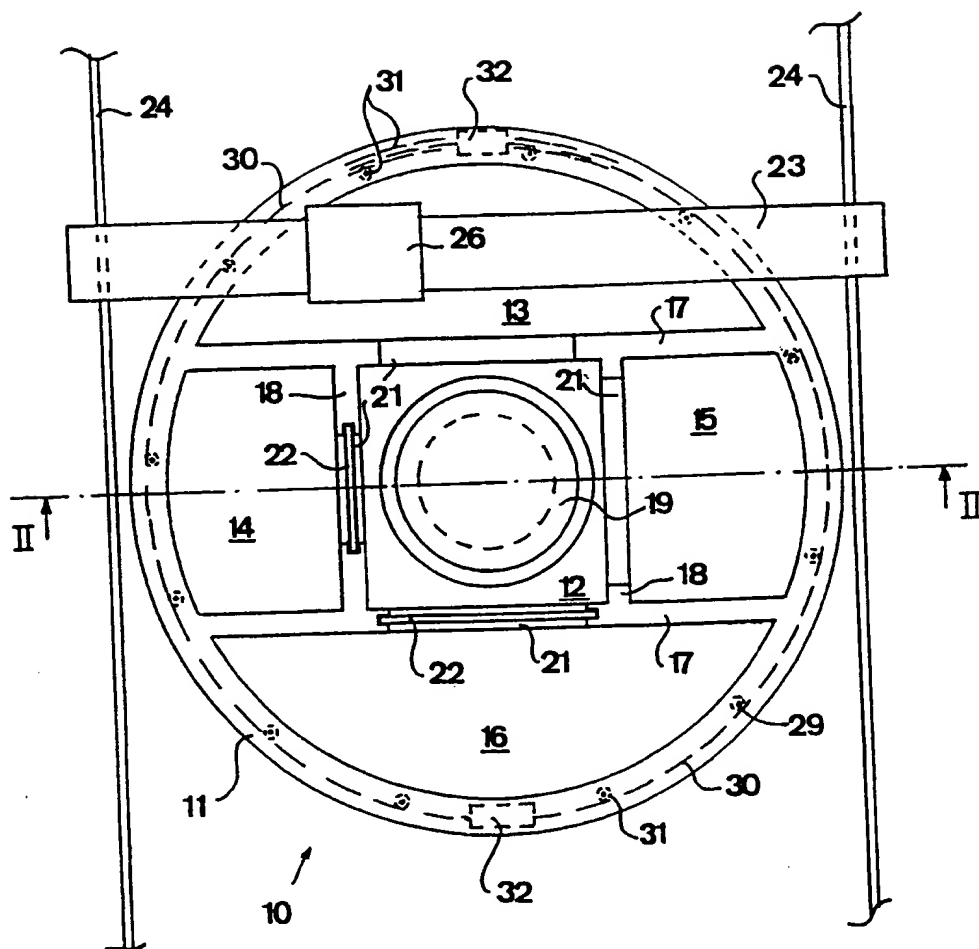
16. A method according to claim 15, characterized in that during the course of the casting process tightening members are provided in said wall member in such a manner that they extend in at least one of the directions about said spaces and along said spaces, and that the tightening members after the casting process are tightened to prestress said wall member.

17. A method according to claim 16, characterized in that the tightening members are provided in tubes provided in said wall member.

18. A method according to claim 17, characterized in that after or in connection with said tightening concrete is injected into said tubes.

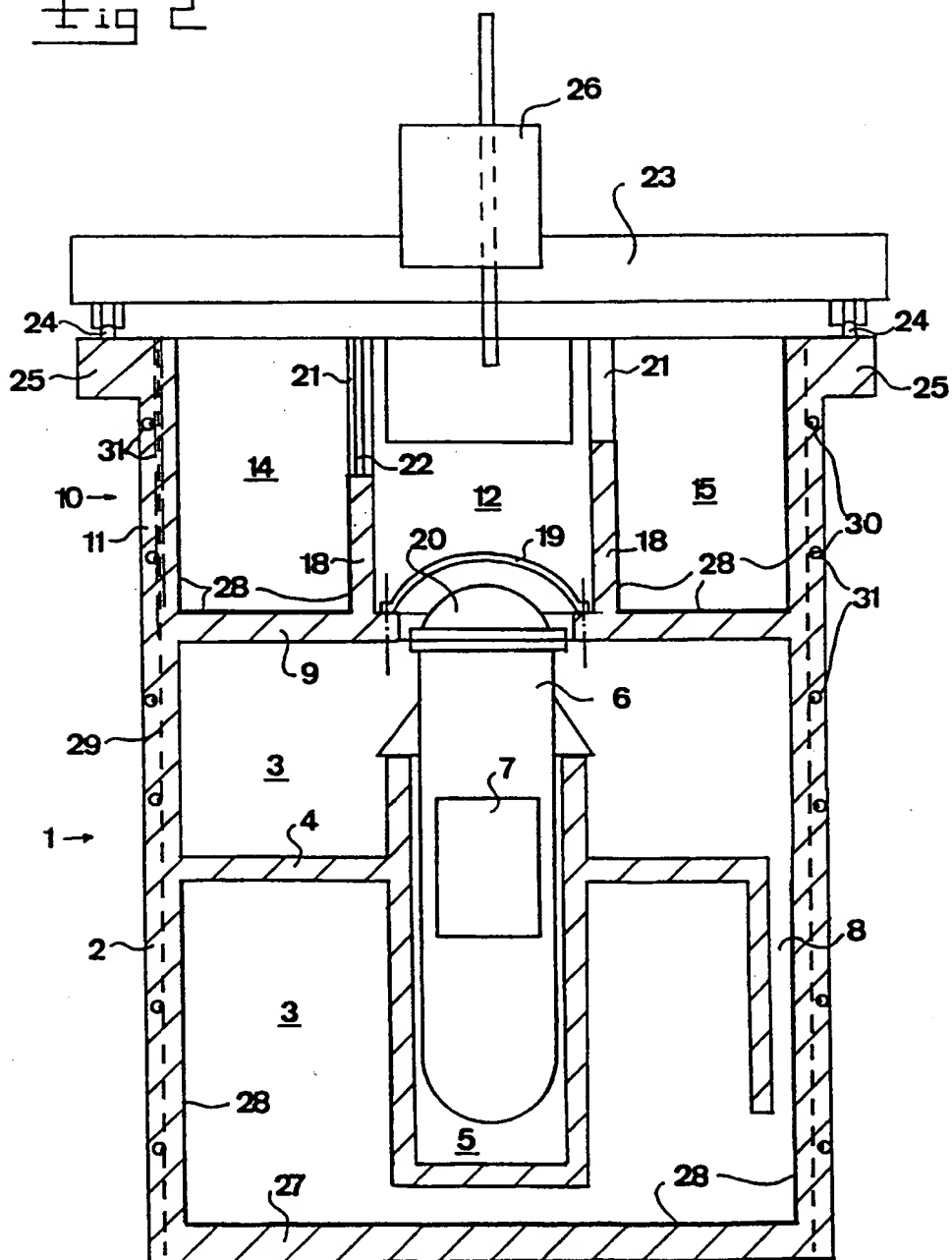
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Fig 1



2/2

Fig 2



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/021

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G21C 1/00, G21C 21/00, E04G 11/22 // G21C 13/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: G21C, E04G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	Patent Abstracts of Japan, abstract of JP 5-107381 A (CENTRAL RES INST OF ELECTRIC POWER IND), 27 April 1993 (27.04.93) --	1-2
A	"Handboken Bygg, M" 1985, Liber Förlag, STOCKHOLM, page 89-96 --	3-17
A	"Handboken Bygg, V", 1985, Liber Förlag, STOCKHOLM, page 681 --	3-17



Further documents are listed in the continuation of Box C.



See patent family annex.

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International application No.

PCT/SE 98/021

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 864377 A (MONK & COMPANY LIMITED), 6 April 1961 (06.04.61), figures 1-3 --	1-17
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A	GB 1218248 A (AB BYGGFORBATTRING), 6 January 1971 (06.01.71), figure 36 --	1-17
A	US 5201161 A (KAMEI), 13 April 1993 (13.04.93) -- -----	1-17

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/SE 98/0021

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ART 34 AMOT
Claims

1. A nuclear reactor device comprising:
 - a reactor containment (1), formed by a first wall member (2) defining an inner space (3),
 - a reactor vessel (6), housing a reactor core (7) and being provided in the inner space (3), and
 - an upper space (10) provided above the reactor containment (1) and defined by a second wall member (11),

10 characterized in that the first wall member (2) and the second wall member (11) have, seen in a horizontal section, an essentially identical cross-sectional shape and form an essentially common cylinder.
- 15 2. A nuclear reactor device according to claim 1, characterized in that said cross-sectional shape is essentially circular.
- 20 3. A nuclear reactor device according to claim 2, characterized in that the first wall member (2) and the second wall member (11) are cast in a continuous piece by means of sliding form casting.
- 25 4. A nuclear reactor device according to claim 3, characterized in that the first wall member (2) and the second wall (11) are cast in concrete with reinforcement members (29, 30) provided in the concrete and comprising tightening members (30) arranged to enable a biasing of said wall members (2, 11).
- 30 5. A nuclear reactor device according to claim 4, characterized in that said tightening members (29) extend in the second wall member (11) at least in one of the directions about the upper space (10) and along the upper
- 35 space (10).

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ART 34 AMDT

6. A nuclear reactor device according to any one of the preceding claims, characterized in that at least the second wall member (11) comprises a wall coating (28) provided onto the inner side.

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7. A nuclear reactor device according to any one of the preceding claims, characterized in that the upper space (10) is divided into part spaces (12 - 16) by means of at least one primary wall element (17) extending between two separated attachment portions of the second wall member (11).

8. A nuclear reactor device according to claim 7, characterized by two primary wall elements (17) separated from each other and each extending between two separated attachment portions of the second wall member (11).

9. A nuclear reactor device according to claim 8, characterized in that the two primary wall elements (17) are essentially parallel to each other.

10. A nuclear reactor device according to any one of claims 8 and 9, characterized by two secondary wall elements (18) which extend between the two primary wall elements (17) and which between themselves and together with the primary wall elements (17) form an isolated part space (12).

11. A nuclear reactor device according to claim 10, characterized in that the isolated part space (12) is located above a cover device (19) of a separating wall (9) separating the upper space (10) from the inner space (3).

12. A nuclear reactor device according to any one of the preceding claims, characterized by door members (22) arranged to provide a passage (21) between at least two of said part spaces (12 - 16).

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ART 34 AMDT

13. A method of constructing a nuclear reactor device, comprising the steps of:

- casting a first wall member defining an inner space of a reactor containment intended to comprise a reactor vessel to be arranged in the inner space and housing a reactor core, and
- providing a second wall member defining an upper space above the reactor containment, characterized in that the first wall member and the second wall member are cast by means of an essentially common form being lifted upwardly during the course of the casting process.

14. A method according to claim 13, characterized in that the said form comprises a sliding form.

15. A method according to any one of claims 13 and 14, characterized in that the casting of the second wall member is preceded by the lifting to a position of prepared blocks comprising reinforcement members and an inner wall coating.

16. A method according to claim 15, characterized in that during the course of the casting process tightening members are provided in said wall member in such a manner that they extend in at least one of the directions about said spaces and along said spaces, and that the tightening members after the casting process are tightened to prestress said wall member.

17. A method according to claim 16, characterized in that the tightening members are provided in tubes provided in said wall member.

18. A method according to claim 17, characterized in that after or in connection with said tightening concrete is injected into said tubes.

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum)

PCT 50557 AK

Box No. I TITLE OF INVENTION

"A nuclear reactor device"

Box No. II APPLICANT

Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)

ABB Atom AB
SE-721 63 Västerås
Sweden

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (i.e. country) of nationality:
SwedenState (i.e. country) of residence:
SwedenThis person is applicant
for the purposes of:☐ all designated
States☒ all designated States except
the United States of America☐ the United States
of America only☐ the States indicated in
the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)

CALLIN, Jan-Eric
Isälvsvägen 16
SE-722 31 Västerås
Sweden

This person is:

☐ applicant only☒ applicant and inventor☐ inventor only (If this check-box
is marked, do not fill in below.)State (i.e. country) of nationality:
SwedenState (i.e. country) of residence:
SwedenThis person is applicant
for the purposes of:☐ all designated
States☐ all designated States except
the United States of America☒ the United States
of America only☐ the States indicated in
the Supplemental Box☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE: OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf
of the applicant(s) before the competent International Authorities as:☒ agent☐ common representative

Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)

BJERKÉNS PATENTBYRÅ KB, represented by
BERGLUND, Stefan; BJERKÉN Håkan; or
OLSSON, Jan
Östermalmsgatan 58
SE-114 50 Stockholm
SWEDEN

Telephone No.

08-662 08 70

Facsimile No.

08-663 02 60

Teleprinter No.

☐ Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

If none of the following sub-boxes is used, this sheet is not to be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

CARLSSON, Claes
Spikverksgatan 180
SE-724 79 Västerås
Sweden

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:
Sweden

State (i.e. country) of residence:
Sweden

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

IVUNG, Bengt
Grillugnsgratan 8
SE-724 76 Västerås
Sweden

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:
Sweden

State (i.e. country) of residence:
Sweden

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

KUKKOLA, Timo
Aarnionkatu 3
FIN-26100 Rauma
Finland

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:
Finland

State (i.e. country) of residence:
Finland

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☐ AP ARIPO Patent: GH Ghana, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☐ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|---|---|
| <input type="checkbox"/> AL Albania | <input type="checkbox"/> LV Latvia |
| <input type="checkbox"/> AM Armenia | <input type="checkbox"/> MD Republic of Moldova |
| <input type="checkbox"/> AT Austria | <input type="checkbox"/> MG Madagascar |
| <input type="checkbox"/> AU Australia | <input type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input type="checkbox"/> AZ Azerbaijan | |
| <input type="checkbox"/> BA Bosnia and Herzegovina | <input type="checkbox"/> MN Mongolia |
| <input type="checkbox"/> BB Barbados | <input type="checkbox"/> MW Malawi |
| <input type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MX Mexico |
| <input type="checkbox"/> BR Brazil | <input type="checkbox"/> NO Norway |
| <input type="checkbox"/> BY Belarus | <input type="checkbox"/> NZ New Zealand |
| <input type="checkbox"/> CA Canada | <input type="checkbox"/> PL Poland |
| <input type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> CN China | <input type="checkbox"/> RO Romania |
| <input type="checkbox"/> CU Cuba | <input type="checkbox"/> RU Russian Federation |
| <input type="checkbox"/> CZ Czech Republic | <input type="checkbox"/> SD Sudan |
| <input type="checkbox"/> DE Germany | <input type="checkbox"/> SE Sweden |
| <input type="checkbox"/> DK Denmark | <input type="checkbox"/> SG Singapore |
| <input type="checkbox"/> EE Estonia | <input type="checkbox"/> SI Slovenia |
| <input type="checkbox"/> ES Spain | <input type="checkbox"/> SK Slovakia |
| <input type="checkbox"/> FI Finland | <input type="checkbox"/> SL Sierra Leone |
| <input type="checkbox"/> GB United Kingdom | <input type="checkbox"/> TJ Tajikistan |
| <input type="checkbox"/> GE Georgia | <input type="checkbox"/> TM Turkmenistan |
| <input type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TR Turkey |
| <input type="checkbox"/> HU Hungary | <input type="checkbox"/> TT Trinidad and Tobago |
| <input type="checkbox"/> IL Israel | <input type="checkbox"/> UA Ukraine |
| <input type="checkbox"/> IS Iceland | <input type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> US United States of America |
| <input type="checkbox"/> KE Kenya | |
| <input type="checkbox"/> KG Kyrgyzstan | <input type="checkbox"/> UZ Uzbekistan |
| <input type="checkbox"/> KP Democratic People's Republic of Korea | <input type="checkbox"/> VN Viet Nam |
| | <input type="checkbox"/> YU Yugoslavia |
| <input type="checkbox"/> KR Republic of Korea | <input type="checkbox"/> ZW Zimbabwe |
| <input type="checkbox"/> KZ Kazakstan | |
| <input type="checkbox"/> LC Saint Lucia | |
| <input type="checkbox"/> LK Sri Lanka | |
| <input type="checkbox"/> LR Liberia | |
| <input type="checkbox"/> LS Lesotho | |
| <input type="checkbox"/> LT Lithuania | |
| <input type="checkbox"/> LU Luxembourg | |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

In addition to the designations made above, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except the designation(s) of _____
The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIMFurther priority claims are indicated in the Supplemental Box ☐

The priority of the following earlier application(s) is hereby claimed:

Country (in which, or for which, the application was filed)	Filing Date (day/month/year)	Application No.	Office of filing (only for regional or international application)
item (1) Sweden	21/04/97	9701487-2	
item (2)			
item (3)			

Mark the following check-box if the certified copy of the earlier application is to be issued by the Office which for the purposes of the present international application is the receiving Office (a fee may be required):

☒ The receiving Office is hereby requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s): (1)

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / SE

Earlier search Fill in where a search (international, international-type or other) by the International Searching Authority has already been carried out or requested and the Authority is now requested to base the international search, to the extent possible, on the results of that earlier search. Identify such search or request either by reference to the relevant application (or the translation thereof) or by reference to the search request:

Country (or regional Office): Sweden Date (day/month/year): 14/11/97 Number: SE97/00528

Box No. VIII CHECK LIST

This international application contains the following number of sheets:

- 1. request : 4 sheets
- 2. description : 10 sheets
- 3. claims : 3 sheets
- 4. abstract : 1 sheets
- 5. drawings : 2 sheets
- Total : 20 sheets**

This international application is accompanied by the item(s) marked below:

- 1. ☒ separate signed power of attorney
- 2. ☐ copy of general power of attorney
- 3. ☐ statement explaining lack of signature
- 4. ☐ priority document(s) identified in Box No. VI as item(s):
- 5. ☒ fee calculation sheet
- 6. ☐ separate indications concerning deposited microorganisms
- 7. ☐ nucleotide and/or amino acid sequence listing (diskette)
- 8. ☒ other (specify): ITS-report

Figure No. (2) of the drawings (if any) should accompany the abstract when it is published.

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request):

Stockholm, 20 April 1998

BJERKENS PATENTBYRÅ KB

Stefan Berglund

For receiving Office use only

1. Date of actual receipt of the purported international application:	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority specified by the applicant: ISA /	
6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid	

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

The demand must be filed directly with the competent International Preliminary Examining Authority, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ SE

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND	
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference PCT 50557 cg	
International application No. PCT/SE98/00721	International filing date (day/month/year) 21.04.98	(Earliest) Priority date (day/month/year) 21.04.97	
Title of invention "A nuclear reactor device"			
Box No. II APPLICANT(S)			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) ABB Atom AB SE-721 63 Västerås SWEDEN		Telephone No.:	
		Facsimile No.:	
		Teleprinter No.:	
State (that is, country) of nationality: SWEDEN		State (that is, country) of residence: SWEDEN	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) CALLIN, Jan-Eric Isälvsvägen 16 SE-722 31 Västerås SWEDEN			
State (that is, country) of nationality: SWEDEN		State (that is, country) of residence: SWEDEN	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) CARLSSON, Claes Spikverksgatan 180 SE-724 79 Västerås SWEDEN			
State (that is, country) of nationality: SWEDEN		State (that is, country) of residence: SWEDEN	
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.			

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

IVUNG, Bengt
Grillugnsatan 8
SE-724 76 Västerås
SWEDEN

State (that is, country) of nationality:
SWEDEN

State (that is, country) of residence:
SWEDEN

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KUKKOLA, Timo
Aarnionkatu 3
FIN-26100 Rauma
FINLAND

State (that is, country) of nationality:
FINLAND

State (that is, country) of residence:
FINLAND

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

☐

Further applicants are indicated on another continuation sheet.

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative

and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.

☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

BJERKÉNS PATENTBYRÅ KB, represented by
BERGLUND, Stefan; BJERKÉN, Håkan;
FRÖDERBERG, Oskar; or OLSSON, Jan;
Östermalmsgatan 58
SE-114 50 Stockholm
SWEDEN

Telephone No.:

08-662 08 70

Facsimile No.:

08-663 02 60

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed

the description ☐ as originally filed
☐ as amended under Article 34

the claims ☐ as originally filed
☐ as amended under Article 19 (together with any accompanying statement)
☐ as amended under Article 34

the drawings ☐ as originally filed
☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☐ which is the language in which the international application was filed.

☐ which is the language of a translation furnished for the purposes of international search.

☒ which is the language of publication of the international application.

☒ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (<i>specify</i>) | : | sheets |

For International Preliminary Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (<i>specify</i>): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

Stockholm, 5 November 1998

BJERKÉNS PATENTBYRÅ KB

Stefan Berglund

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

- | | |
|--|---|
| 3. <input type="checkbox"/> The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. | <input type="checkbox"/> The applicant has been informed accordingly. |
| 4. <input type="checkbox"/> The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5. | |
| 5. <input type="checkbox"/> Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82. | |

For International Bureau use only

Demand received from IPEA on:

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PCT 50557 cg	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/SE98/00721	International filing date (<i>day/month/year</i>) 21.04.1998	Priority date (<i>day/month/year</i>) 21.04.1997	
International Patent Classification (IPC) or national classification and IPC ₆ G21C 1/00, G21C 21/00, E04G 11/22 // G21C 13/00			
Applicant ABB Atom AB et al			

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.
<input checked="" type="checkbox"/>	This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
	These annexes consist of a total of <u>4</u> sheets.
3.	This report contains indications relating to the following items:
I	<input checked="" type="checkbox"/> Basis of the report
II	<input type="checkbox"/> Priority
III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	<input type="checkbox"/> Lack of unity of invention
V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	<input type="checkbox"/> Certain documents cited
VII	<input type="checkbox"/> Certain defects in the international application
VIII	<input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 06.11.1998	Date of completion of this report 21.07.1999
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Tomas Lund / JA A Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/S. 8/00721

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☐ the international application as originally filed.

☒ the description, pages 1-11, as originally filed,
 pages _____, filed with the demand,
 pages _____, filed with the letter of _____,
 pages _____, filed with the letter of _____.

☒ the claims, Nos. _____, as originally filed,
 Nos. _____, as amended under Article 19,
 Nos. _____, filed with the demand,
 Nos. 1-18, filed with the letter of 12.05.1999,
 Nos. _____, filed with the letter of _____.

☒ the drawings, sheets/fig 1-2, as originally filed,
 sheets/fig _____, filed with the demand
 sheets/fig _____, filed with the letter of _____,
 sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.

PCT/SE98/00721

V. Resoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-18</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1-18</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1-18</u>	YES
	Claims	_____	NO

2. Citations and explanations

Cited documents:

D1: JP, A, 5-107381

D2: "Handboken Bygg, M" 1985, Liber Förlag, Stockholm, page 89-96

D3: "Handboken Bygg, V" 1985, Liber Förlag, Stockholm, page 681

The claimed invention relates to a method to construct a nuclear reactor structure and a nuclear reactor structure. The nuclear reactor structure is partitioned into two constructional parts, each with a separate function. The applicant suggests that these parts have the same cross-sectional shape. This is achieved by using a sliding form to cast the nuclear reactor structure. As a result the two constructional parts can be constructed without an intermediate interruption.

The object of the claimed invention is to simplify the construction of a nuclear reactor structure. This reduces the time, and thereby the costs, for the construction of a nuclear reactor structure.

D1 shows a nuclear reactor structure partitioned into an upper part and a lower part. These parts have practically the same cross-sectional shape. However, they do not form an essentially common cylinder with an essentially identical cross-sectional shape. This known reactor is constructed by using pre-fabricated modules. The document does not disclose or suggest the construction of a reactor building in situ by means of a casting process, e g by using a sliding form. Therefore, the claimed invention according to claims 1 and 13 differs from this document and it cannot be considered obvious to the person skilled in the art to construct a reactor building according to the claimed invention. .../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE98/00721

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

The claim 13 of the claimed invention states a construction method involving a movable casting form. This is a well-known construction method, as can be seen e.g. in D1 and D2. However, it is not known to utilise this construction method for the purpose of the present invention.

Still, does it involve an inventive step to use this known method to construct, in a novel way, a nuclear reactor structure? The person skilled in the art would probably consider various construction methods, e g casting with a sliding form. The construction of nuclear reactor structures may, however, imply specific aspects. By constructing a reactor building according to the claimed invention, efficiency can be improved and construction costs reduced. Therefore, the claimed invention according to claim 13 is considered to involve an inventive step.

None of the other documents cited in the International Search Report disclose an arrangement or a method as stated in the claimed invention.

Therefore, the stipulated criteria regarding novelty, inventive step and industrial applicability under PCT Article 33 (1) are fulfilled for the claimed invention.